

Optimum Power Utilization Through Mobile Cloud Computing

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Abstract:- Mobile Cloud Computing is the realm of cloud computing under the mobile environment, merging the qualities of mobile network and cloud computing. It is not a requisite for the mobiles to be endowed with CPU speed, memory, capacity, etc. for processing complex computing modules and data, as it will be performed within the cloud system itself. Mobile Cloud Computing mitigates the ordeals of mobile devices such as memory, battery life and bandwidth. This paper is put forward to show how the Battery power of a mobile phone can be saved using Mobile cloud computing.

Keywords:- Mobile Cloud Computing, Battery Power, Power Tutor, Android Applications, Mobile Devices.

I. INTRODUCTION

In the recent years, advances are made in applications and as well as in the area of network computing, the Mobile cloud computing have paved the way as one of the conceivable technology for mobile services. Mobile cloud computing is a fusion of cloud computing, mobile computing and wireless networks to carry high trait computational belongings or resources to network operators, mobile end user, providers of cloud computing, etc. Mobile cloud computing is a new staging for linking the mobile gadget and cloud computing to create an advanced framework. It introduces a framework where both data processing and data storage happens farther of mobile gadget. In this engineering, cloud achieves a heavy hoisting of computing concerted functions and store large quantity of data. The accelerated development of mobile cloud computing becomes a dominant movement in the field of information technology. The mobile devices in mobile cloud computing are facing countless number of issues in their resources (example: battery life, bandwidth and storage) and communication (example: security and mobility). Among the scientific and industrial communities, Mobile cloud computing has emerged as a significant research topic. Due to the application model in the age of Internet, Its applications are becoming more and more accepted. Thus, diverse application based on mobile cloud computing have been made and supplied to users, such as Navigation systems for Mobile phones and Gmail, Google's Maps, voice search, and various other applications on an Android platform. The fundamental goal of cloud computing is to distribute different services, processing capacity over the Internet, software, automating system, increasing storage, reducing cost and separation of service delivery from technology which are underlying and provides mobility and flexibility of information.

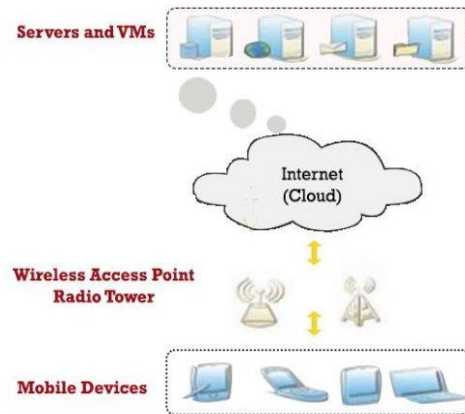


Fig 1:- Mobile Cloud Computing

Mobile cloud applications shift the data storage form and the computing power from mobile devices (phones) to the cloud environment. Mobile computing is an advanced prototype for mobile applications where data processing and storage are moved from mobile devices to powerful integrated computing environments which are located in clouds over the Internet. All these integrated applications are then pervaded over wireless connection based on a thin native client or web browser on the mobile devices. Sooner, the mobile cloud computing concept can be described as an integration of cloud computing and mobile web, which is a popular tool for mobile users to access services and applications on the Internet.

II. SYSTEM DESIGN

There are many different solutions that have been put forward to organize the screen, disk in a systematic as well as intelligent way to lessen power utilization and to increase the CPU performance. As in to full-fill these results, it requires a change in the design of mobile devices or require advanced hardware components that results in the increase of costs. But these changes may not be achievable for every mobile devices. Several computations offloading techniques are introduced in order to run large computations and complex processing from resource limited devices like mobile devices to resourceful machines such as servers in clouds. Mobile cloud computing evades a long time execution of applications on mobile devices which ends up in a huge amount of power consumption.

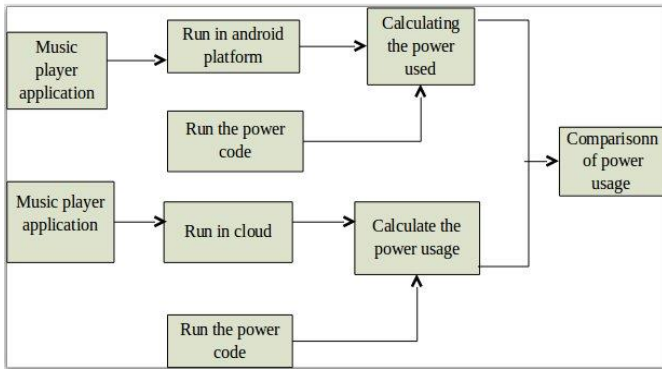


Fig 2:- System Architecture

The system architecture in Fig. 2 depicts the pictorial representation of the whole process of the system.

III. PROPOSED SYSTEM

The energy regulation in the smart phones can be elevated at the operating system level by designing an application or by strengthening the battery. Through this paper we are developing a mobile application and it is made to run in a cloud environment through mobile device and the same application is made to run in the local mobile environment. An application which calculates and displays the energy or power consumed is used to calculate the power consumed by the developed mobile application when run cloud environment as well as local mobile environment. And the values are compared to obtain the result.

A. Developing Mobile application

There are varieties of android mobile application developer platforms available in the market. Android Software Development kit is a commonly used platform to build a mobile application.



Fig 3:- Android Development Tools

The android developer tools can be used by an expert programmer to develop an android application. Now a days there are IDEs coming on the market which is so simple that a non-programmer can develop a mobile application without any prior knowledge of programming. These IDEs include MIT App inventor, Thinkable, App Builder Appy Pie, etc.

In this, a simple music player application is created using App Builder Appy pie. The music player application

involves play list from which the user can select the songs. This App builder is a no-code mobile application builder platform and is the fast-growing Cloud based mobile application builder software which permits users with novices' skills to create iPhone and Android applications for mobile and smart phones, also publish them to Google Play and iTunes.

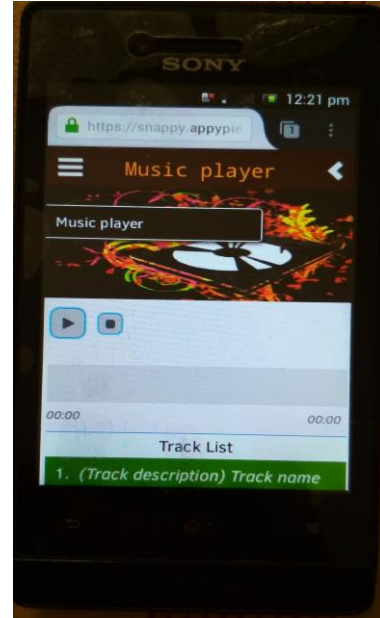


Fig 4:- Music Player Mobile Application

B. Power Tutor for calculating battery usage



Fig 5:- Power Tutor

There are only a few applications available in the market which shows energy consumed by the mobile phones. Now days the increasing security of the mobile phones makes the accessing of software and hardware data from the phone difficult. In order to find out the measurements, a low-end phone is used for the research. Power tutor is an application for mobile phones which shows the power consumed by major system components such as CPU, display, Network interface and GPS receiver and different applications. This application helps the software developers to see impact of design changes on power utilization. The end users as well as the application users can also use the power tutor to determine how their actions while using mobile phone applications are impacting the battery life of their respective mobile phones.

C. Running the applications

The developed mobile application is made to run on the cloud environment from the mobile phone, it is also made to run on the mobile local environment. Power tutor application is run while the application is playing on both environment. A detailed study is conducted while the process is taking place. The power consumed by the Media Server and Audio are comparatively low when the mobile application is playing on the cloud environment compared to the local environment. The results are shown in the following figures.

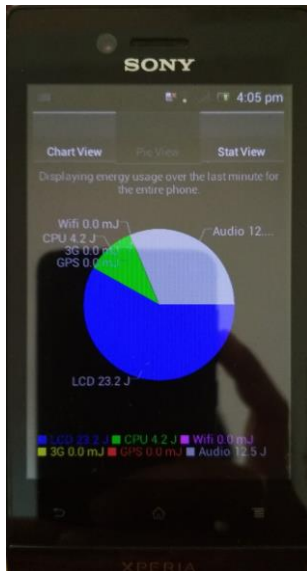


Fig 6:- Result for cloud

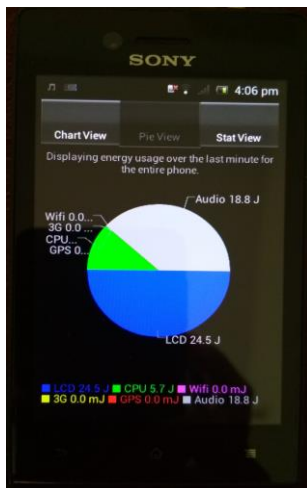


Fig 7:- Result for phone



Fig 8:- Optimized result

IV. CONCLUSION

The Battery power consumed by the music player in the android device is measured correctly by the Power tutor application. Our inquiry advises that cloud computing can likely salvage energy for mobile users. But, not all applications are energy regulated when migrated to the cloud. Mobile cloud computing services would be automatically different from cloud services for desktops because they must offer energy reductions.

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